

C.) AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings of claims in the Application.

1. (currently amended) A dental x-ray diagnostic apparatus for performing real-time digital radiography of a patient skull, comprising:

a base frame ~~to~~ for supporting the apparatus;

a sliding frame configured to move ~~which is capable of sliding~~ vertically along the base frame and the sliding frame being moved ~~which is operated~~ by an independent actuator under microcomputer control;

a rotary frame coupled to the sliding frame by a cinematic unit, and the rotary frame supporting an x-ray source at one end, and an x-ray imager at the other end;

the said cinematic unit being configured to execute unit, allowing execution of orbital movements of the said x-ray source and the said x-ray imager around the patient skull, characterized in that the orbital movement is composed of wherein the orbital movements comprise one rotation movement and two linear movements in a plane, and the orbital movements of the x-ray source and the x-ray imager being driven by independent actuators in the cinematic unit controlled by data momentarily supplied from a microcomputer.

2. (currently amended) The apparatus as set forth in claim 1 wherein the x-ray imager has a ~~linear shaped an~~ active area of a size approximately ~~corresponding to the x-ray field size at the film plane~~ equivalent to a conventional radiographic film.

3. (original) An apparatus as in claim 1, further comprising a second x-ray imager.

4. (currently amended) The apparatus as set forth in claim 3, wherein said second x-ray imager has ~~an a~~ a linear shaped active area of a size less than a conventional radiographic film ~~approximately corresponding to the minimum useful x-ray field size at the film plane.~~

5. (currently amended) The apparatus as set forth in claim 3 wherein said second x-ray imager is associated with a horizontal scanning movement, and has a linearly shaped active area oriented vertically with a height substantially greater than a width of a length approximately corresponding to the minimum useful height of the x-ray field size at the film plane.

6. (currently amended) The apparatus as set forth in claim 3 wherein said second x-ray imager is associated with a horizontal scanning movement, and is provided with an independent active actuator capable of performing ~~the~~ a linear translation of said second x-ray imager during ~~the~~ a scanning movement under computer control.

7. (currently amended) The apparatus as set forth in claim 3, wherein said second x-ray imager is associated with a vertical scanning movement, and has a linearly shaped active area oriented horizontally with a width substantially greater than a height of a length approximately corresponding to the minimum useful width of the x-ray field size at the film plane.

8. (currently amended) The apparatus as set forth in claim 3, wherein said second x-ray imager is associated with a rotational scanning movement, and has a linearly shaped active area for use with a narrow x-ray beam of a length approximately corresponding to the half the minimum useful height of the x-ray field at the film plane.

9. (currently amended) The apparatus as set forth in claim 3, wherein said second x-ray imager is associated with a vertical, or horizontal, or rotational scanning movement, and ~~the~~ an x-ray beam is collimated by a collimator intercepting the x-ray beam before ~~the~~ a patient and in proximity of the patient, which is provided with an independent active actuator capable of performing the linear or rotational translation of the ~~same secondary~~ collimator during a scanning movement under computer control.

10. (currently amended) The apparatus as set forth in claim 1, comprising a ~~primary~~ collimator operated by independent active actuators under microcomputer control, allowing resizing of ~~the~~

an x-ray field to any desired format required for ~~the~~ a chosen radiographic modality as well as ~~the~~ a translation of the ~~same~~ x-ray field during a vertical or horizontal or rotational scanning process.

11. (currently amended) The apparatus as set forth in claim 3 wherein a mechanism is given providing relocation of said second x-ray imager selectively between ~~the~~ a Cephalographic and ~~the~~ a Panoramic position.

12. (original) The apparatus as set forth in claim 11 wherein such mechanism comprises a telescopic arm providing relocation either manually or automatically by an independent actuator under microcomputer control upon user command.

13. (original) The apparatus as set forth in claim 11 wherein such mechanism comprises a folding arm providing relocation either manually or automatically by an independent actuator under microcomputer control upon user command.

14. (original) The apparatus as set forth in claim 11 wherein such mechanism comprises a detachable connector allowing in a secure and ergonomic way the manual connection and disconnection of the x-ray imager selectively between the Cephalographic and the Panoramic position.

15. (currently amended) The apparatus as set forth in claim 1 wherein ~~the~~ a patient positioning system used in Cephalography is provided with independent active actuators by which ~~it~~ the patient positioning system can be translated relative to ~~its~~ a corresponding support frame in order to maintain a firm patient position during a horizontal or vertical scanning process where ~~the~~ a movement of the ~~same~~ support frame is involved.

16. (currently amended) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography, comprising the steps of:

positioning ~~the~~ a patient by ~~a the relevant~~ patient positioning system;
irradiating ~~the~~ a patient skull during ~~the~~ an orbital movement of an x-ray source and an x-ray imager; ~~and~~;
performing acquisition of ~~the~~ image data by the x-ray imager and digital processing of the ~~image same~~ data for ~~the~~ reconstruction of ~~the~~ a diagnostic image; ~~and~~
wherein the orbital movement of the x-ray source and the x-ray imager being capable of one rotational movement and two linear movements in a plane, and the orbital movements of the x-ray source and the x-ray imager being driven by independent actuators in the cinematic unit controlled by data supplied from a microcomputer.

17. (canceled)

18. (currently amended) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography in cephalography, comprising the steps of:

aligning ~~the~~ an x-ray source with ~~the~~ an x-ray imager, either manually or automatically;
positioning ~~the~~ a patient by ~~the relevant~~ a patient positioning system;
setting ~~the~~ a collimator to provide format for a narrow x-ray beam laying in ~~the~~ a vertical plane;
starting a scanning process during which the x-ray beam is linearly translated through ~~the~~ a patient skull in ~~the~~ a horizontal (Y) direction by ~~the coherent~~ a coordinated horizontal movement of the x-ray source and the x-ray imager under computer control; ~~and and~~;
performing acquisition of ~~the~~ image data by the x-ray imager, and computer processing for ~~the~~ reconstruction of ~~the~~ a diagnostic image, inclusive of correction of ~~the~~ a magnification distortion in the horizontal direction.

19. (currently amended) The method of claim ~~19~~ 18 wherein, the step of instead of aligning the x-ray source with an the second x-ray imager for Cephalography, the first x-ray imager is relocated includes the step of relocating the x-ray imager, either manually or automatically, from a Panoramic position to the a Cephalographic position aligned with the x-ray source required for

Cephalography.

20. (currently amended) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography in cephalography, comprising the steps of:

aligning ~~the~~ an x-ray source with ~~the~~ an x-ray imager, either manually or automatically, wherein the step of aligning the x-ray source with an x-ray imager includes the step of relocating the x-ray imager, either manually or automatically, from a Panoramic position to a Cephalographic position;

positioning ~~the~~ a patient by ~~the relevant~~ a patient positioning system;

setting ~~the~~ a collimator to provide format for a narrow x-ray beam laying in ~~the~~ a vertical plane;

starting a scanning process during which the x-ray beam is linearly translated through ~~the~~ a patient skull in ~~the~~ a horizontal (Y) direction by ~~the coherent~~ a coordinated horizontal movement of the ~~primary x-ray~~ collimator and the x-ray imager under computer control; and

performing acquisition of ~~the~~ image data by the x-ray imager, and computer processing for ~~the~~ reconstruction of ~~the~~ a diagnostic image.

21. (currently amended) A method for operating a dental x-ray diagnostic apparatus performing real-time digital radiography in cephalography, comprising the steps of:

aligning ~~the~~ an x-ray source with ~~the~~ an x-ray imager, either manually or automatically, wherein the step of aligning the x-ray source with an x-ray imager includes the step of relocating the x-ray imager, either manually or automatically, from a Panoramic position to a Cephalographic position;

positioning ~~the~~ a patient by ~~the relevant~~ a patient positioning system;

setting ~~the~~ a collimator to provide format for a narrow x-ray beam laying in ~~the~~ a horizontal plane;

starting a scanning process during which the x-ray beam is linearly translated through ~~the~~
a patient skull in the a vertical (V) direction by the coherent a coordinated vertical movement
of the x-ray source and the x-ray imager under computer control; ~~and and,~~

performing acquisition of the image data by the x-ray imager, and computer processing
for the reconstruction of the diagnostic image, inclusive of correction of the magnification
distortion in the horizontal direction.

22. (currently amended) A method for operating a dental x-ray diagnostic apparatus performing
real-time digital radiography in cephalography, comprising the steps of:

aligning ~~the an~~ x-ray source with ~~the an~~ x-ray imager, either manually or automatically,
wherein the step of aligning the x-ray source with an x-ray imager includes the step of
relocating the x-ray imager, either manually or automatically, from a Panoramic position to a
Cephalographic position;

positioning ~~the a~~ patient by ~~the relevant a~~ patient positioning system;

setting ~~the a~~ collimator to provide format for a narrow x-ray beam laying in ~~the a~~
horizontal plane;

starting a scanning process during which the x-ray beam is linearly translated through ~~the~~
a patient skull in the a vertical (V) direction by the coherent a coordinated vertical movement
of the ~~primary x-ray~~ collimator and the x-ray imager under computer control; ~~and and,~~

performing acquisition of ~~the~~ image data by the x-ray imager, and computer processing
for ~~the~~ reconstruction of ~~the a~~ diagnostic image.

23. (currently amended) A method for operating a dental x-ray diagnostic apparatus performing
real-time digital radiography in cephalography, comprising the steps of:

aligning ~~the an~~ x-ray source with ~~the an~~ x-ray imager, either manually or automatically;

positioning ~~the a~~ patient by ~~the relevant a~~ patient positioning system;

setting ~~the a~~ collimator to provide format for a narrow x-ray ~~beam;~~ beam;

starting a scanning process during which the x-ray beam is rotationally translated through
~~the a~~ patient skull by ~~the coherent a coordinated~~ rotational movement of the ~~primary x-ray~~

collimator and the x-ray imager under computer control, while the x-ray source is fixed in position; and ~~and,~~

performing acquisition of ~~the~~ image data by the x-ray imager, and computer processing for ~~the~~ reconstruction of ~~the~~ a diagnostic image.